

SEVERE LOCAL STORMS.

The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau.

Place.	Date.	Time.	Width of path.	Loss of life.	Value of property destroyed.	Character of storm.	Remarks.	Authority.
			<i>Yards.</i>					
Waxahachie, Tex. (west of)...	1	P. m.				Small cyclone.....	Considerable property damage.....	Dallas Morning News (Dallas, Tex.).
Washington, D. C.....	2	P. m.		3		Electrical and rain.....	Slight property damage.....	Washington Herald (Washington, D. C.).
Plattsville, Wis., and vicinity..	4					Electrical, rain and wind.....	Floods and wind caused destruction of thousands of acres of corn; barns and trees struck by lightning; much damage to newly constructed highway.	Times-Journal (Dubuque, Iowa).
Austin, Tex., and vicinity...	9	P. m.				Tornado.....	Buildings and wires slightly damaged; considerable property damage at Creedmoor.	Dallas Morning News (Dallas, Tex.).
Nixon, Tex. (west of).....	9		20			Wind.....	Crops, buildings, etc., in path destroyed.....	San Antonio Daily Express (San Antonio, Tex.).
Milano, Tex.....	9	P. m.	25 to 30			do.....	General damage done.....	Do.
St. Louis, Mo.....	9	1.30 p. m.			\$15,000	Thunderstorm.....	Street car and electric light service impaired; a number of buildings struck by lightning; cellars flooded.	Globe-Democrat (St. Louis, Mo.).
Bartlett, Tex.....	10-11					Rain.....	Severe damage suffered by railways, bridges, and crops; telephone communication cut off.	Dallas Morning News (Dallas, Tex.).
Marmarth, N. Dak.....	12					Wind.....	Several buildings wrecked.....	Fargo Forum (Fargo, N. Dak.).
Anoka, Minn., and vicinity..	20	P. m.				Hail, wind, and rain.....	Heavy damage to crops and buildings.....	Washington Herald (D. C.).
Zanesville, Ohio.....	21					Wind.....	Business section suffered severe losses.....	Daily News (Chicago, Ill.).
Belaire, Ohio (west of).....	21					Rain.....	Homes flooded, corn crop destroyed, and live stock drowned.	Do.
Buffalo, N. Y.....	21	P. m.				Rain and hail.....	Minor damage.....	Express (Buffalo, N. Y.).
Grand Haven, Mich.....	21					Wind.....	Much damage by high winds to trees, wires, etc.	Weather Bureau official.
Madison, S. Dak.....	21				10,000	Hail.....	Severe general damage; 3-inch hailstones fell.....	Herald-Examiner (Chicago, Ill.).
Mint Springs, Va. (Augusta County).....	22		10		5,000	Small tornado.....	Damage principally to buildings and trees; 2 injured.	Weather Bureau official.
Buffalo, N. Y.....	22					Gale.....	Velocity of wind 60 miles; no damage reported.	Express (Buffalo, N. Y.).
New Orleans, La.....	25	P. m.			10,000	Electrical.....	Severe damage to power station; street car lines tied up for 3 hours.	Times-Picayune (New Orleans, La.).
Terre Haute, Ind.....	29	P. m.	16 to 30		10,000-15,000	Thunderstorm and wind.....	Severe damage by wind; 4 persons injured.....	Weather Bureau official.
Scranton, Pa.....	30	P. m.				Wind.....	Industries generally temporarily crippled; most damage suffered by power-carrying apparatus.	Washington Herald (Washington, D. C.).
Buffalo, N. Y., and vicinity..	30			1		Wind and thunderstorm.....	Buildings leveled and much damage in fruit belt along south shore of Lake Ontario; velocity of wind 74 miles.	Washington Post (Washington, D. C.).
Cleveland, Ohio, and vicinity.	30			5		Wind.....	Property damaged to the extent of thousands of dollars; no serious damage in Cleveland; wind 50 to 74 miles.	Plain Dealer (Cleveland, Ohio).
Western New York, Pennsylvania, and Lower Lake region.	30			2		Gale.....	Severe windstorm causes heavy damage to property, crops, etc.; fires caused by lightning; velocity of wind 74 miles.	New York Times (New York, N. Y.).
New York City, N. Y.....	30	P. m.				Wind.....	Minor damage; cellars flooded; 52-mile wind....	Democrat Chronicle (Rochester, N. Y.).
Dayton, Ohio.....	30				19,800	Electrical.....	"Baby blimp" dirigible balloon and hangar destroyed; 1 person seriously injured.	Do.
Rochester, N. Y.....	30					Heavy gale.....	Great damage wrought to apple crop; thousands of bushels blown off.	Weather Bureau official.

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STORMS AND WEATHER WARNINGS.

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WASHINGTON FORECAST DISTRICT.

West Indian hurricane of Sept. 8 to 15.—This disturbance made its appearance the morning of the 8th to the southeastward of Barbados, traveled west-northwestward and crossed the Grenadines during the night of the 8th and passed on to the Caribbean Sea. Its course from the Grenadines was west-northwest and the afternoon of the 10th it was encountered by the steamship *West Faralon* in approximately Lat. 17° N. and Long. 68° W., when the barometer fell to 28.38 inches with winds of hurricane force. Passing northwestward from this position its center crossed Haiti and then pursued a northerly course, passing the Bermudas on the 15th and what seemed to be this storm was in the vicinity of Iceland on the 22d. The disturbance was of rather small diameter but of great intensity throughout its course. It is reported to have caused considerable damage to shipping, buildings, and crops and to have caused the loss of a number of lives in the eastern islands of the West Indies and the Bermudas.

On the morning of the 8th, when the signs of the approach of this hurricane were unmistakable, the fol-

lowing warning was issued by the district forecaster at San Juan, Porto Rico:

Tropical disturbance east of the island of Trinidad at 8 a. m., probably moving west-northwest. Caution advised through eastern Caribbean Sea. Further information will issue about 3 p. m.

Based on 1 p. m. special observations from eastern Caribbean stations the following warning was issued by the district forecaster at San Juan, Porto Rico:

1 p. m., tropical storm of moderate intensity with center south of the island of Barbados, moving west-northwest, will probably pass to the south of the island of Porto Rico during Friday, the 9th. Caution advised throughout the eastern Caribbean Sea area. Further information will issue about 10 p. m.

At noon of the 9th the district forecaster at San Juan, Porto Rico, issued the following warning:

Noon broadcast. Tropical storm center about 200 miles southeast of island of Porto Rico at noon, moving west-northwest at rate of 12 miles an hour. Moderate to strong winds with rain probable along south coast of Porto Rico to-night.

At 8 a. m. of the 10th the following information was issued by the district forecaster at San Juan, Porto Rico:

Tropical storm apparently increased in area and extent during the night and continued its movement west-northwestward. This morning the center was about 300 miles southwest of Porto Rico; squalls and heavy rains occurred during the night and early morning in Porto Rico, but the island is now out of the danger zone.

These and other warnings issued by the San Juan station and the Central Office were disseminated to West Indian stations and to stations on the Gulf and Atlantic coasts. They were also sent by Navy Radio to vessels at sea.

On Sunday, the 11th, when there were indications that this disturbance was moving northward over Haiti, the following advisory information was issued from the Central Office:

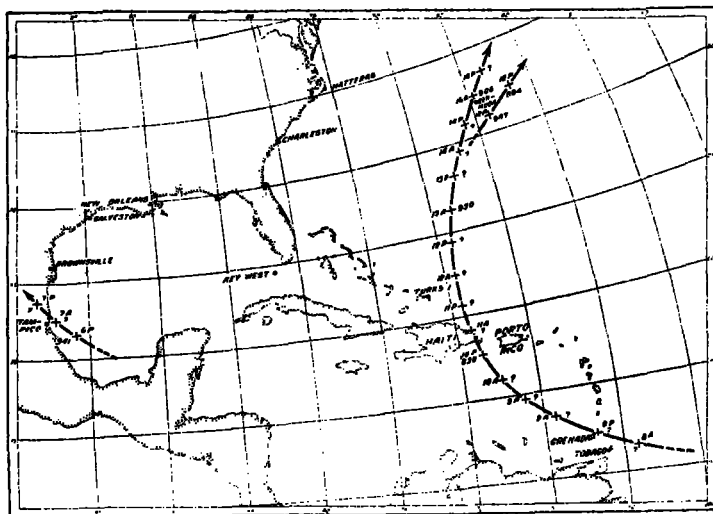


FIG. 1.—Path of hurricane of Sept. 8-15, 1921.

Advisory, 10 p. m. Tropical storm has moved northward and to-night its center is over northwestern Haiti. Future movement uncertain but probably northward. Shifting gales over and to eastward of the Bahamas during the next 36 hours.

This disturbance, as stated in the opening paragraph, moved northward from Haiti, and on the morning of the 14th notification was sent the Bermudas that the disturbance was moving northeastward toward these islands. Its center passed near the Bermudas the morning of the 15th, when the pressure fell to near 29 inches with winds of hurricane force.

The night of the 15th the following communication was sent the Office of Naval Communications, Navy Department, Washington, D. C.:

Please broadcast the following tonight: "Storm of hurricane intensity moving northeastward from the vicinity of Bermudas. It will pass onto transatlantic steamship lanes during Friday and continue to move eastward with unabated intensity."

As previously stated this storm was apparently the one charted over Iceland the morning of the 22d, when the barometer stood at 28.70 inches with wind of gale force. It is a remarkable coincidence that at the time the southern hurricane was centered north of Haiti that the steamship *Capillo* reported by radio having encountered on the 12th a hurricane of small diameter, barometer below 29 inches, near and immediately southeast of the Bermudas, moving rapidly northeast. This disturbance was separate and distinct from the primary disturbance herein referred to. Moreover, immediately preceding the appearance of the tropical storm in the eastern Caribbean Sea, there were signs of a disturbance over the southwest Gulf of Mexico, as indicated by reports by radio from vessels in that region. It passed on to the Mexican coast during the 7th and was dissipated, but there is reason to believe that the phenomenal rains in southern Texas on the 9th and 10th were associated with this disturbance. Conceding that the disturbance that appeared on the 8th southeast of Barbados was in existence previously to that date, it follows that from

the 6th to 14th there were three storms of a tropical nature over the southern waters at approximately the same time.

The paths of these disturbances will be found elsewhere in this number of the REVIEW.

In the Washington Forecast District no storm warnings were issued or required for the east coast of the Gulf of Mexico and for the Atlantic coast south of Cape Henry.

For the Atlantic coast north of Cape Henry.—Southwest storm warnings were ordered on the 11th for the coast at and north of Delaware Breakwater, when a disturbance of marked intensity was over the Great Lakes and moving northeastward, and strong winds, at times reaching gale force, occurred over the stretch of coast where warnings were displayed. On the 25th southwest storm warnings were displayed on the coast at and north of Delaware Breakwater when a disturbance of considerable intensity was centered north of the Great Lakes and moving eastward toward the St. Lawrence valley, and it was attended by strong south shifting to west winds during the night of the 25th along the coast north of Sandy Hook. On the 30th southwest storm warnings were displayed on the coast between the Virginia Capes and Eastport, Me., when a disturbance of marked intensity was central over the Great Lakes and moving eastward: the conditions forecast occurred along the coast covered by warnings, the maximum velocity being 56 miles an hour from the south at New York City.

On the Great Lakes.—Storm warnings were displayed on one or more of them on the 17th, 20th, 21st, 25th, 26th, 28th, 29th, and 30th. On the 17th the display was that of southwest warnings on Lakes Erie, Huron, and Ontario, when a disturbance of considerable intensity had its center north of Lake Superior. On the 20th the display was for strong south to west winds on Lakes Erie, Huron, Michigan, and Superior except the extreme west portion, the disturbance at the time of the display being central north of Minnesota, and on the morning of the 21st the display of southwest warnings was extended to Lake Ontario. The disturbance on the morning of the 21st was central north of Lake Superior and moving east-northeastward. It was attended by strong south to west winds and gales over the entire region of the Great Lakes. The morning of the 25th northwest storm warnings were displayed on Lakes Huron, Erie, and Ontario, when a disturbance of considerable intensity was central north of Lake Huron and moving eastward. This disturbance produced northwest winds on Huron and extreme eastern Superior, but no winds of consequence elsewhere. On the evening of the 28th northwest storm warnings were displayed on western Lake Superior, and the morning of the 29th southwest warnings were ordered for eastern Lake Superior and for Lakes Michigan, Huron, and Erie, and on the morning of the 30th for Lake Ontario, in connection with a disturbance of the Alberta type. This disturbance increased markedly in intensity during the night of the 29th, and during the 30th it was attended by general gales on the Great Lakes, except western Lake Michigan. The maximum wind velocity reported was 76 miles from the southwest the afternoon of the 30th on extreme eastern Lake Erie.

No abnormally cold weather occurred in the Washington Forecast District during the month, although frosts occurred during the third decade at a number of points along the northern border.

CHICAGO FORECAST DISTRICT.

Fire-weather warnings and forecasts were continued to the district forester at Missoula, Mont., for distri-